

Research Article

Enthusiasm to Acceptance of SARS_COV_2 Vaccine among Health Care Workers in Oromia Regional State, Ethiopia. An Online Based Cross-Sectional Study, 2021

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Abstract

Background: The COVID-19 pandemic is expected to continue to impose enormous burdens of morbidity and mortality while severely disrupting societies and economies worldwide. Vaccines are a key strategy to stop the escalation of the COVID-19 pandemic. Vaccines are the effective way to control and prevent a several diseases, save lives, and reducing current health emergency, as well as increasing the immunity of the population.

Objective: To find out eagerness to acceptance of SARS-COV-2 vaccine among health care workers in Oromia regional state, Ethiopia: An online-based cross-sectional study

Methods: An online based cross sectional study design was carried out from April 13/2021 to September 12/2021. Data was collected through employing online questioner, and then the collected data were coded and analyzed by statistical packages for social sciences 25.0 version statistical software. The statistical significance was set at a p-value ≤ 0.05 .

Findings: The current study revealed that 178(42.2%) of health care workers intended to receive the SARS-COV-2 vaccines. The results of this study showed that the majority of participants don't believe that SARS-COV-2 vaccine is effective and safe ($n=279.66.1\%$),and couldn't save lives ($n=228,54.1\%$). Factors such as age group >55 (AOR:2.75;95%CI: 1.092-5.472;P=0.008),Male(AOR:1.86; 95%CI: 1.243-2.796;P=0.003),nurses (AOR: 2.17;95%CI:0.621-5.087;P=0.0094) and midwives (AOR:2.521;95%CI:2.497-8.24; P=0.0002),married (AOR:1.74;95%CI: 0.218-4.530;P=0.006), health care workers who had contact with COVID -19 patient were twice as likely to accept the vaccine (AOR:1.93;95%CI: 1.360- 3.784;P=0.0001) and health care workers who indicated that they had more serious medical condition (AOR:2.61;95%CI:0.981-3.618;P=0.007) proved to be significant predictors of the acceptability of the COVID-19 vaccine. Factors such as taking vitamin C(AOR:1.624;95%CI:0.945-2.596;P=0.0003), poor safety of vaccines (AOR: 7.041;95%CI:3.692-13.375;P=0.000),those believe effective medicine avail for treating COVID-19 (AOR:2.16;95%CI:1.596-3.485; P=0.0076), no adequate trials about COVID-19 (AOR:7.041;95%CI:3.692-13.375;P=0.000),and unwanted side effects of the vaccines (AOR: 3.422;95%CI:1.448-8.096;P=0.005) were identified as indicators why health care workers would decline uptake of COVID-19 vaccines.

Conclusion and recommendation: This survey revealed that the eagerness to acceptance of covid-19 vaccine among health care workers in Oromia regional state was somewhat meager. Nurses and Midwives were more likely to accept the SARS-COV-2vaccines than others health care workers. Oromia health bureau should have to give training about SARS-COV-2vaccine to all health care workers to strengthen SARS-CoV-2 vaccine acceptance.

ABBREVIATIONS

BEFO: Biiroo Eegumsa fayyaa Oromiyaa; **COVID-19:** Coronavirus Disease2019; **ETB:** Ethiopian Birr; **HCWs:** Health Care Workers; **H1N1:** Swine flu; **SARS-CoV-2:** Severe Acute Respiratory Syndrome Coronavirus-2; **TV:**Television; **U.S:** United States; **WHO:** World Health Organization

INTRODUCTION

The coronavirus disease 2019 pandemic has spread across the world with millions infected and hundreds of thousands dead [1]. Coronavirus disease 2019 caused by severe acute respiratory syndrome coronavirus-2,is believed to have originated from the Huanan Seafood Wholesale Market, Wuhan,

Hubei province, China which was declared as a pandemic by the World Health Organization [2]. While most countries impacted have developed successful response strategies and observed significant improvements, the U.S.(as of June 28th,2020) leads globally with 2.50 million cases and over 125,000 deaths[3]. The spread of SARS-CoV-2,the causative agent of COVID-19,has resulted in an unprecedented global public health and economic crisis[4].The outbreak was declared a pandemic by the World Health Organization on 11 March 2020, and development of COVID-19 vaccines has been a major undertaking in fighting the disease. As of December 2020, many candidate vaccines have been shown to be safe and effective at generating an immune response with interim analysis of phase III trials suggesting efficacies as high as 95% [5]. Since the first case was detected in Egypt on the 14th day of February 2020, the number of cases in Africa has been on a steady rise, though has remained lower than the rest of the world. [6]. With over 1.3 billion people and a weak health system plagued by lack of healthcare infrastructure and shortages of health manpower, limited access to social protection and low health literacy, the public health measures implemented at the start of the pandemic will not be sufficient to stop further progress of the virus in Africa or end the pandemic. A COVID-19 vaccine may be the most practical and feasible solution for Africa. Several vaccine candidates are currently under different stages of development and some maybe available for phase 3 trials before the end of 2020 [7]. Vaccines are a key strategy to stop the escalation of the COVID19 pandemic[8]. While large-scale vaccine rejection threatens herd immunity goals, large-scale acceptance with local vaccine rejection can also have negative consequences for community (herd) immunity, as clustering of non-vaccinators can disproportionately increase the needed percentage of vaccination coverage to achieve herd immunity in adjacent geographical regions and encourage epidemic spread[9]. There are certain beliefs and barriers regarding vaccination among the general population. Vaccine coverage and its acceptance varies with respect to behavior of the people, geography, and time [10]. Furthermore, certain key factors such as severity of the disease, previous vaccination history, lack of belief in health care services, route of administration of vaccine, economic and educational status of the individuals, recommendations from doctors, and cost of vaccine also determines the acceptance of vaccines. The first and foremost public concern about the novel vaccines against new emerging pandemics is the safety and effectiveness of candidate vaccines as witnessed in 2009 H1N1 pandemic [11]. Governments, public health officials and advocacy groups must be prepared to address hesitancy and build vaccine literacy so that the public will accept immunization when appropriate. Anti-vaccination activists are already campaigning in multiple countries against the need for a vaccine; with some denying the existence of COVID-19 altogether [12]. Misinformation spread through multiple channels could have a considerable effect on the acceptance of a COVID-19 vaccine. The accelerated pace of vaccine development has further heightened public anxieties and could compromise acceptance[13]. The public's willingness to accept a vaccine is therefore not static; it is highly responsive to current information and sentiment around a COVID-19 vaccine, as well as the state of the epidemic and perceived risk of contracting the disease. Under these current plausible COVID-19 vaccine acceptance rates, possible levels of existing

protective immunity though it is unclear whether post-infection immunity confers long-term immunity and the rapidly evolving nature of misinformation surrounding the pandemic[14], it is unclear whether vaccination will reach the levels required for herd immunity. Vaccine hesitancy is reported as one of the major threats to global health by WHO. High vaccine coverage is needed to flatten the epidemic curve. Vaccine hesitancy affects not only the individual who is hesitant to take the vaccine, but the whole community, making it difficult to reach the threshold to confer herd immunity[15]. There are certain beliefs and barriers regarding vaccination among the general population. These studies was investigate the intention to accept a future SARS-COV-2 vaccine to determine the factors associated with intent to accept or refuse the vaccine, and helps the government in identifying the risk health care workers and develop better strategies for mass vaccination against SARS-COV-2.

METHODOLOGY

Study design, period and study area

A cross-sectional study design was conducted in 21 zone of Oromia regional state. The Oromia regional state has population of approximately about 55 million people and covers an area of around 286,612 km². Oromia regional state have 100 hospitals in which 62 were primary hospitals, 36 were general hospitals and 4 were referral hospitals except Shashemene referral hospitals and Jimma university specialized hospitals. There were 20,541 HCWs with sex composition of 11,422 males and 9,119 females in Oromia regional state hospitals in which 7793 were worked in primary hospitals, 9411 were worked in general hospitals, 1839 were worked in referral hospitals. The study design was carried out for 3 months (from April 13/2021 to September 12/2021).

Study participants

All HCWs who were at study area during the study period was study population. Willingness to consent and those capable of using internet on a smart phone or computer, Age above 18 years of age and current place of work in Oromia regional state were included in the study. Younger (aged less than 18 years) HCWs, non-health care employees and those unwilling to participate were excluded.

Sample size determination & sampling technique

The sample size was determined by using the single population proportion formula: Due to absence of data in the country, proportion of population who had eagerness to acceptance of covid-19 vaccine among health care workers was assumed to be 50%. Then, $n = \frac{(Z_{\alpha/2})^2 P(1-P)}{d^2}$, $n = (1.96)^2 \cdot 0.5(1-0.5)/(0.05)^2 = 384$. By adding 10% contingency for non-response rate, a total of 422 study participants were involved. The multi stage sampling techniques were used to approach the participants. Then, the sample size to each selected hospitals was allocated proportionally. Finally, the study participants were selected randomly.

Study variables

Dependent variable was vaccine acceptance, and independent variables were socio demographic factors (age, gender, education

status, religion, occupation, marital status, monthly income, occupation, and work place of the respondents), Acceptance rate regarding SARS-COV-2 vaccine, Factors that can improve SARS-COV-2 vaccine acceptance, Factors that may hinder SARS-COV-2 vaccine acceptance.

Data collection instruments

Due to limitations in doing face-to-face research during the current active SARS-COV-2 outbreak, this study did an online survey during the period April 13/2021 to September 12/2021, were collected from HCW individuals aged greater than 18 years across 21 zone of Oromia regional state. Well-designed online self-administered questionnaire has been used to collect data for assessing to determine the acceptance rate of a SARS-COV-2 vaccine in HCWs. The questionnaire was translated into local languages (Oromiffa). Acceptance rate regarding SARS-COV-2 vaccine in HCWs had five parts. Part I. Socio-demographic parameters. The socio-demographic parameters included (age, gender, education status, religion, occupation, marital status, monthly income, category of health care workers, and work place of the respondents) it also include presence of chronic illness. Part II. Beliefs toward SARS-COV-2 vaccine/ vaccination were dichotomized as Yes=1 and No=0. Part III. SARS-COV-2 vaccine acceptance were 5-point Likert scale (5=Completely agree, 4=Somewhat agree, 3= Neutral/no opinion, 2=Somewhat disagree, 1=Completely disagree) with questions about acceptance and concerns regarding SARS-COV-2 vaccines. Part IV. factors that can improve SARS-COV-2 vaccine acceptance were dichotomized as Yes =1 and No=0, and in addition, respondents were asked questions on their SARS-COV-2 experience, including previous contact with a SARS-COV-2 patient, whether a member of their household, relatives, friends, or neighbors has been diagnosed with SARS-COV-2. Part V. Factors that may hinder SARS-COV-2 vaccine acceptance were 3-point Likert scale as Yes =1, No=0 and None=I don't know

Data quality assurance

The questioner translated from English to Oromiffa and back to English to check the consistency. To ensure the quality, the questionnaire checked for completeness, accuracy, clarity, and consistency by the principal investigator. HCWs have been informed of detailed information with practice on how to complete and sent the questionnaire. Duplication of responses was controlled by restricting to one response.

Statistical analysis

Data were cleaned and analyzed through employing statistical packages for social sciences 25.0 version statistical software. Categorical variables were presented as numbers and percentages, while continuous variables were presented as median and standard deviation. Bivariate analysis was used to examine the association between exposure and outcome variables, and regression analysis to derive the odds ratios (OR) and their 95% confidence intervals (95%CI) for variables significant at bivariate analysis. Multivariate binary logistic regression analyses were used to identify the determinants of intention to vaccinate and the associated factors that perhaps hinder SARS-COV-2 vaccine acceptance. All variables were

considered statistically significant at 95% confidence interval (p value ≤ 0.05).

Ethical Approval

The study was commenced after approved by health research ethical review committee of health research directorate of Oromia regional health bureau (Ref: BEFO/HBTFU/146/10239). The study participants were informed about behind the scenes, and oral consent was obtained from each participant. All the HCWs were informed about the objectives of the study, and they agreed and signed a consent form before participation. Behind the scenes were kept and anonymized, and data were accessible only to the researchers.

Operational Definitions

Coronavirus disease 2019: It is caused by severe acute respiratory syndrome coronavirus 2, a novel zoonotic coronavirus that emerged from Wuhan, China [16].

Vaccine: a product that stimulates a person's immune systems to produce immunity to a specific disease, protecting the person from that disease [17].

RESULTS

Socio-demographic characteristics of healthcare worker's There were a total of 422 health care workers who completed the online survey, Of the 422 health care workers, more than half (n=214, 56%) were aged 19–34 years. The majority of the health care workers were males (n=148, 50.5%), Protestant (n=171, 40.5%), living in an urban area (n=384, 91%), and earn monthly income between 5001– 10000 ETB (n=228, 54%). The majority of health care workers were nurses (n=128, 30.3%), and midwives (n=75, 17.8%). In terms of marital status, (n=214, 50.7%) of the health care workers were single. Majority (n=344, 81.5%) of the health care workers reported no chronic disease and had no any addiction (n=365, 86.5%). The source of information for them majorly was TV (n=219, 51.9%). The prevalence of SARS-COV-2 vaccine acceptance among health care workers were (n=178, 42.2%) (Table 1). The results of this study showed that the majority of participants don't believe that COVID-19 vaccine is effective and safe (n=279, 66.1%), and couldn't save lives (n=228, 54.1%). In terms of face mask the most of participants were confident to wear face masks, and wash their hands regularly even if they get vaccinated, (n=342, 81%), as well as they believe that vaccine could not stop the transmission of the COVID-19, (n=219, 51.9%) and only protect new infections (n=309, 73.3). The majority of respondents were believes that COVID-19 vaccine is not available in Ethiopia at that moment, (n=297, 70.4%). Majority (n=405, 95.9%) of the participants were strongly believes that it is important to isolate and treat people who are infected with COVID-19 are effective ways to reduce the spread of the virus, and only few of respondents were take covid-19 vaccine shots and recommend others (n=101, 23.9%) (Table 2). The results of this study showed that about (n=90, 21.3%) had completely disagree in the information provided by the media is the fight against COVID-19. Also, majority (n=122, 28.9%) of the health care workers had neutral/no opinion to accept COVID-19 vaccine if government recommended it only. Furthermore, more than half (n=245, 58.1%) of health care workers neutral/no opinion

Table 1: Socio-demographic characteristics of healthcare workers in Oromia regional state, Ethiopia (n=422).

Variable	Category	Frequency	Percent
Age	19-34 years	213	50.5
	35-54 years	181	42.9
	>54 years	28	6.6
Sex	Male	225	53.3
	Female	197	46.7
Residence	Urban	384	91.0
	Rural	38	9.0
Income	<5000 ETB	146	34.6
	5001-10000 ETB	228	54.0
	>10000 ETB	48	11.4
Religion	Protestant	171	40.5
	Orthodoxy	129	30.6
	Muslim	88	20.9
	Others	34	8.1
Marital status	Single	214	50.7
	Married	181	42.9
	Divorced	19	4.5
	Widowed	8	1.9
Profession	Doctors	51	12.1
	Nurse	128	30.3
	Pharmacy	70	16.6
	Psychiatry	45	10.7
	Midwives	75	17.8
	Clinical lab	31	7.3
	Others	22	5.2
Any chronic illness	Yes	78	18.5
	NO	344	81.5
Any addiction	Yes	57	13.5
	No	365	86.5
Source of information	TV	219	51.9
	Websites	109	25.8
	Telegram/Facebook	67	15.9
	Others	27	6.4
Prevalence of SARS-COV-2 -19 vaccine acceptance	Yes	178	42.2
	No	244	57.8
Beliefs toward SARS-COV-2 vaccine/vaccination			

that the COVID-19 vaccine will lose its effect with sunshine. Majority (n=178, 42.2%) of respondents were completely agree to take the vaccine if available free and if generally available (n=98, 23.3%) (Table3). Majority(n=396,93.8%) of respondents tested for SARS-COV-2and being negative (n=417,98.1%).About (n=215,50.9%) of the respondents indicated that they had not been in contact with any SARS-COV-2patient,and (n=250,59.2%) respondents indicated that no member in their households had been diagnosed with COVID-19.Also (n= 373,64.7%) of the respondents had none of their relatives/friends been died with COVID-19.Majority (n=282,66.8%)of the participants were not trained about COVID-19 vaccine. More than half (n=224,53.1%) of respondents were judge as having more serious medical condition escalate willingness to accept COVID-19 vaccine (Table 4). Preponderance(n=143,33.9%) of health care workers were unwilling to accept the COVID-19 vaccines due to concern about the COVID-19 virus human made, and deliberately released.

Also majority (n=234, 55.5%) of HCWs were unwilling to accept the COVID-19 vaccines due to concern about the safety. (n=126, 19.9%) respondents were had misunderstanding about flu vaccine as it protect s/he from COVID-19 virus. Also, taking vitamin C or other vitamins (n=147, 34.8%), eating garlic (n=123, 29.1%), and effective medicine avail for treating COVID-19 virus (n=106,26.1%) were unwilling to accept due to concern of they protect against COVID-19 respectively. About (n=235,55.7%) and (n=241,57.1%) of them were unwilling to accept the COVID-19 vaccines due to concern after side effects of the vaccine, and wear of face mask after s/he vaccinated, respectively (Table 5). Results of this survey showed that the acceptance rate for vaccination against SARS-COV-2 was (n=178,42.2%) as shown in (Table 5) .Participants in the age group >55 were 3 times as likely to accept the vaccine (AOR:2.75;95%CI: 1.092-5.472;P=0.008).Male subjects were twice as likely to accept the vaccine (AOR:1.86;95%CI:1.243-2.796;P=0.003). Nurses (AOR: 2.17; 95%CI: 0.621-5.087; P=0.0094) and Midwives (AOR: 2.521; 95%CI: 2.497-8.24; P=0.0002) were more likely to accept the COVID-19 vaccines than others profession. Participants who were married (AOR: 1.74; 95%CI: 0.218-4.530; P=0.006) were more likely to accept vaccine. Health care workers who had contact with COVID -19 patient were twice as likely to accept the vaccine (AOR: 1.93;95%CI: 1.360- 3.784;P=0.0001)than who hadn't contact with COVID-19 patients. Health care workers who indicated that they had more serious medical condition were 3 times as likely to accept the vaccine (AOR:2.61;95%CI:0.981-3.618;P=0.007)than who hadn't (Table 6). Logistic regression model for factors that perhaps hinder acceptance of SARS-COV-2 vaccine among healthcare workers. Taking vitamin C or other vitamins were 2 times as likely to hinder acceptance of SARS-COV-2vaccine(AOR:1.624;95%CI:0.945-2.596;P=0.0003) and those believe effective medicine avail for treating COVID-19 were 2 times as likely to hinder acceptance of COVID-19 vaccine(AOR:2.16;95%CI:1.596-3.485;P=0.0076).Fear of side effects (AOR:3.422;95%CI:1.448-8.096;P=0.005)and why wearing face mask after vaccination (AOR:4.738;95%CI:2.272-9.978;P=0.000) were 3 times and 5 times as likely to hinder acceptance of COVID-19 vaccine respectively. No adequate trials about COVID-19 vaccine were 7 times as likely to hinder acceptance of COVID-19 vaccine (AOR:7.041;95%CI:3.692-13.375;P=0.000) (Table 7).

DISCUSSION

Coronavirus disease 2019 pandemic was first reported in Wuhan city, china on 31 December 2019 and its socio-economic and public health importance disease that cause a huge of economic losses, more than million death of people and affected a huge number of people in worldwide[18].In public health, vaccination is one of the most important advances[19].Scientists have been racing to develop and test new vaccines to protect against SARS-CoV-2 and the speed of scientific discovery related to COVID19 is unprecedented[20]. The current study displayed that the eagerness to acceptance of SARS-COV-2 vaccine among health care workers. The prevalence of vaccine acceptance was 178 (42.2%), which was higher than the study done in Democratic Republic of the Congo(28%), Somalia(36.8%),Ghana 39%[21,22,23]. In Oromia regional state, government, public health agencies, and private healthcare systems perhaps work

Table 2: Beliefs toward SARS-COV-2 vaccine among health care workers in Oromia regional state, Ethiopia (n=422).

Statement	Frequency (%)	
	Yes	No
Do you believe covid-19 vaccine could save lives?	194(45.97)	228(54.03)
Do you believe covid-19 vaccine is effective and safe?	143(33.89)	279(66.11)
If you are vaccinated do you need to wear face mask and wash your hands regularly?	342(81.04)	80(18.96)
Do you believe covid19 vaccine is available in Ethiopia?	41(9.72)	381(90.28)
Could this vaccine stop the transmission of Covid-19?	203(48.11)	219(51.89)
Is Covid-19 vaccine currently availing in Ethiopia?	125(29.6)	297(70.4)
Could Covid-19 vaccine only protect new infections?	309(73.23)	114(26.77)
Would you take covid19 vaccine and recommend others?	101(23.94)	321(76.06)
Is isolation and treatment of people who are infected with COVID19 are effective to reduce the spread of the virus?	405(95.97)	17(4.03)
SARS-COV-2 vaccine acceptance measurement		

Table 3: SARS-COV-2 vaccine acceptance scale among health care workers in Oromia regional state, Ethiopia (n=422).

Statement	Frequency	Percent
Are you accept COVID-19 vaccine if generally available?		
Completely agree	98	23.23
Somewhat agree	46	10.9
Neutral/no opinion	132	31.29
Somewhat disagree	49	11.6
Completely disagree	97	22.98
Could you accept COVID-19 vaccine if government recommended it only?		
Completely agree	61	14.46
Somewhat agree	102	24.18
Neutral/no opinion	122	28.9
Somewhat disagree	57	13.5
Completely disagree	80	18.96
Are you trust in the information provided by the media in the fight against COVID-19		
Completely agree	79	18.72
Somewhat agree	98	23.22
Neutral/no opinion	102	24.17
Somewhat disagree	53	12.56
Completely disagree	90	21.33
Are you thinking that sunshine will make COVID-19 vaccine lose its effect?		
Completely agree	32	7.58
Somewhat agree	61	14.45
Neutral/no opinion	245	58.06
Somewhat disagree	53	12.56
Completely disagree	31	7.35
Have taken the vaccine if available free(without payment)?		
Completely agree	178	42.18
Somewhat agree	98	23.22
Neutral/no opinion	102	24.17
Somewhat disagree	33	7.82
Completely disagree	11	2.61
Factors that can improve SARS-COV-2 vaccine acceptance		

Table 4: Factors that can improve SARS-COV-2 vaccine acceptance among health care workers in Oromia regional state, Ethiopia (n=422).

Statement	Frequency (%)	
	Yes	No
Have you trained on COVID 19 vaccine?	140(33.2)	282(66.8)
Are you contact with COVID-19 patient?	207(49.1)	215(50.9)
Are your members of household diagnosed with COVID-19?	172(40.8)	250(59.2)
Would having more serious medical condition escalate willingness to accept COVID 19 vaccine?	224(53.1)	198(46.9)

Is the person you know/your friend/your family member passed away (die) by COVID-19?	149(35.3)	373(64.7)
Have tested for COVID-19?	396(93.8)	26(6.2)
Is your result of COVID test negative?	417(98.1)	5(1.9)
Factors that may hinder SARS-COV-2vaccine acceptance		

Table 5: Factors that perhaps hinder SARS-COV-2 vaccine acceptance among health care workers in Oromia regional state, Ethiopia (n=422).

Statement	Frequency (%)		
	Yes	No	I don't know
Is ordinary flu vaccine protecting you from COVID- 19?	126(29.9)	205(48.6)	91(21.6)
Adequate trials about COVID-19 vaccine/safety	59(14)	234(55.5)	129(30.6)
Will taking vitamin C or other vitamins protect you from COVID-19?	147(34.8)	184(43.6)	91(21.6)
Is there evidence that perhaps eating garlic protect you against COVID-19?	123(29.1)	194(46.0)	105(24.9)
Is there effective medicine avail for treating COV ID-19?	106(26.1)	204(48.3)	112(26.6)
Is COVID-19 virus human made, and deliberately released?	143(33.9)	189(44.8)	90(21.3)
If I vaccinated why I use face mask, so the vaccine had no value against COVID-19 virus?	241(57.1)	148(35.1)	33(7.8)
Is fear of side effects preventing you from taking vaccine for prevention of COVID-19 virus?	235(55.7)	130(30.8)	57(13.5)
Logistic regression model for eagerness to acceptance of SARS-COV-2 vaccine among health care workers			

Table 6: Logistic regression model for eagerness to accept SARS-COV-2 vaccine among health care workers in Oromia regional state, Ethiopia (n=422).

Acceptance of COVID-19 vaccine	N (%)	AOR (95% C.I)	p-value
Age			
19-34 years	213(50.5)	Ref	
35-54 years	181(42.9)	0.75(0.311-1.811)	0.750
>55 years	28(6.6)	2.75(1.092-5.472)	0.008**
Sex			
Female	197(46.7)	Ref	
Male	225(53.3)	1.86(1.243-2.796)	0.003**
Category of health care workers			
Doctor	51(12.1)	Ref	
Nurse	128(30.3)	2.17(0.621-5.087)	0.0094**
Pharmacy	70(16.6)	1.092(0.433-2.754)	0.853
Psychiatry	45(10.7)	1.498(0.555-4.041)	0.425
Midwives	75(17.8)	3.521(2.497-8.247)	0.0002**
Clinical lab.	31(7.3)	1.306(0.493-3.461)	0.592
Others	22(5.2)	0.996(0.324-3.060)	0.996
Marital status			
Single	214(50.7)	Ref	
Married	181(42.9)	1.74(0.218-4.530)	0.006**
Divorced	19(4.5)	1.143(0.248-1.263)	0.864
Widowed	8(1.9)	0.461(0.79-2.682)	0.389
Those who were trained on COVID 19 vaccine			
No	282(66.8)	Ref	
Yes	140(33.2)	1.421(1.20-1.936)	0.091
Contact with COVID-19 patient			
No	215(50.9)	Ref	
Yes	207(49.1)	1.93(1.360-3.784)	0.0001**
Member of household diagnosed with COVID-19			
No	250(59.2)	Ref	
Yes	172(40.8)	1.078(0.715-1.6250)	0.075

More serious medical condition escalate willingness to accept COVID 19 vaccine			
No	224(53.1)	Ref	
Yes	198(46.9)	2.61(0.981-3.618)	0.007**
Person you know/your friend/your family member passed away(die) by COVID-19			
No	373(64.7)	Ref	
Yes	149(35.3)	1.068(0.709-1.607)	0.754
AOR: Adjusted odd ratios, CI: Confidence interval *P value <0.05, **P value <0.01			

Table 7: Logistic regression model for factors that hinder acceptance of SARS-COV-2 vaccine among health care workers in Oromia regional state, Ethiopia (n=422).

Factors that hinder acceptance of COVID-19 vaccine		AOR (95% C.I)	P-value
	N (%)		
Ordinary flu vaccine protect you from COVID-19			
Yes	126(29.9)	Ref	
No	205(48.6)	0.566(0.2681-1.92)	0.134
I don't know	91(21.6)	0.137(0.298-1.180)	0.598
Taking vitamin C or other vitamins protect you from COVID-19			
Yes	147(34.8)	Ref	
No	184(43.6)	1.624(0.945-2.596)	0.0003**
I don't know	91(21.60)	1.024(0.524-2.016)	0.808
There evidence that perhaps eating garlic protect you against COVID-19			
Yes	123(29.1)	Ref	
No	194(46.0)	0.907(0.477-1.726)	0.767
I don't know	105(24.9)	0.796(0.397-1.5976)	0.520
There effective medicine avail for treating COVID-19			
Yes	106(26.1)	Ref	
No	204(48.3)	2.16(1.596-3.485)	0.0076**
I don't know	112(26.6)	0.998(0.488-2.041)	0.097
COVID-19 virus human made, and deliberately released			
Yes	143(33.9)	Ref	
No	189(44.8)	1.01(0.486-1.548)	0.064
I don't know	90(21.3)	0.769(0.285-1.428)	0.976
I vaccinated why I use face mask, so the vaccine had no value against COVID-19 virus			
Yes	264(62.6)	Ref	
No	104(24.6)	4.738(2.272-9.978)	0.000**
I don't know	54(12.8)	0.523(0.241-1.134)	0.101
Fear of side effects prevent you from taking vaccine for prevention of COVID-19 virus			
Yes	235(55.7)	Ref	
No	130(30.8)	3.422(1.448-8.096)	0.005**
I don't know	57(13.5)	0.241(0.098-0.593)	0.001
Adequate trials about COVID-19 vaccine			
Yes	59(14)	Ref	
No	234(55.5)	7.041(3.692-13.375)	0.000**
I don't know	129(30.6)	0.418(0.0731-1.008)	0.147
AOR: Adjusted odd ratios, CI: Confidence interval *P value <0.05, **P value <0.01			

together to provide accurate information about the vaccines to HCWs and the difference in consequences between the approaches to reaching herd immunity must be clearly communicated to HCWs who currently prefer physiologic immunity over vaccination. Achieving herd immunity through previous infection would take significantly longer, incurring an immense cost in health care resources, as well as lives with others

study. In addition, the prevalence was lower than the study conducted in France (77.6%), chine (72.4%), United States (80%), Russia (55%), Saudi Arabia (64.7%), Egypt (45.9%) [24-29]. This perhaps in Oromia regional state HCWs have been exposed to conspiracy theories such as the claims that novel coronavirus was deliberately created and SARS-COV-2 lethality for political gain. Many members of the public, including HCWs,

have been exposed to conspiracy theories (especially on social media) such as the claims that novel coronavirus was intentionally created by the government or that health organizations have exaggerated COVID-19's lethality for pharmaceutical and political gain in this survey. The acceptability of the SARS-COV-2 vaccines in this study is approximately comparable to that of conducted in Hong Kong (40%) [30] had the intention to accepting the SARS-COV-2 vaccine if available. While the COVID-19 vaccines are not yet fully approved for commercial use by the Food and Drug Administration (FDA), the FDA has issued Emergency Use Authorization (EUA) of several vaccines due to the public health emergency, based on data from clinical trials that included tens of thousands of participants. Still, the condensed timeline in which the vaccines were developed and received EUA has raised safety and efficacy concerns for some HCWs in both studies. In this study, older HCWs were accept SARS-COV-2 vaccines was similar to the study conducted in Democratic Republic of the Congo[21] which showed older HCWs accepted to get vaccinated. In addition older HCWs were accept COVID-19 vaccines was contrary to the study employed in Saudi Arabia[28] which showed younger people were willing to accept a vaccine. Because in this study older HCWs may be taking SARS-COV-2 vaccines than younger was due to the notion that older adults and people with serious comorbidities are particularly vulnerable to worse outcomes from SARS-COV-2 can create considerable willing amongst the elderly. Because older adults are more likely to get very sick from COVID-19 and getting very sick means that older adults with COVID-19 might need hospitalization, intensive care, or a ventilator to help them breathe, or they might even die. Older people face significant risk of developing severe illness if they contract the disease due to physiological changes that come with ageing and potential underlying health conditions. The immune system might also explain the much higher risk of older people dying from the virus. As the body ages, it develops low levels of inflammation, and COVID-19 could be pushing the already overworked immune system over the edge, so they have eagerness to accept SARS-COV-2 vaccine than other age categories. The findings also revealed that male health care workers were more likely to accept the SARS-COV-2 vaccines if available compared to females were contrary to study done in Polish [31] study where an affirmative response was more from females. In addition, males were also more likely to accept a vaccine in this survey was, consistent to the study carried out in Nigeria, Ghana, Democratic Republic of the Congo [32,23,21] those showed the higher likelihood for male health care workers to accept COVID-19 vaccination has been attributed to increased risk perception of the disease in men compared to women. Because even though there has been no concrete study conducted on this, many women have taken their complaints online about the vaccine impacting their menstrual cycle. These side effects included having their periods before time, incurring heavy flow, or having multiple periods in the same cycle. Pregnant women and lactating mothers, therefore, have ample grounds to be concerned, especially since none of the vaccine trials included expectant mothers. Women in the childbearing age also have major misgivings about infertility that has recently become another reason to turn down the vaccine. As women are delaying their motherhood plans, they are feeling more apprehensive about such information on infertility that indicate that vaccines may interfere with the female

reproductive due to above reasons females are unwilling to accept SARS-COV-2 vaccine than males. The present study revealed that the majority (n=122, 28.9%) of the health care workers had neutral/no opinion to accept COVID-19 vaccine if government recommended it only which were contrary to the study conducted in Ghana [23] found that health care workers who had trust in the accuracy of the measures taken by the government in the fight against COVID-19 were more likely to accept COVID-19 vaccines if available. Also majority (n=178,42.2%) of respondents take the vaccine if available free and if generally available (n=98,23.3%). In this study the main source of information were TV which were consistent with the study carried out in Egypt[29] demonstrated that social media and TV media are the main source of knowledge for the participants. This study revealed that nurses (AOR: 2.17; 95%CI: 0.621-5.087; P=0.0094) and midwives (AOR: 2.521; 95% CI: 2.497-8.24; P=0.0002) were more likely to accept the COVID-19 vaccines if available is contrary to the study employed in Ghana [23] which showed medical doctors were more likely to accept the SARS-COV-2 vaccines if available compared to nurses and midwives. In our study nurse and midwives had more contact with patients/they also clean the bed of patients because of that they're willing to accept vaccine were escalated. Nurses are on the frontline, and they have a significant role in fighting COVID-19 and they are facing critical shortages of nursing staff, beds, and medical supplies. Professional nurses historically bring compassionate competent care to disaster response but are challenged to provide care when the nature of their work puts them at increased risk. Nurses struggle with feeling physically unsafe in the response situation, such as in times of scarce resources where supplies of such items as personal protective equipment (PPE) may be inadequate. Midwives cannot maintain physical distance with a labouring mother like in other words, making them too prone to acquiring infection with the virus. Midwives in this survey have important dual roles to ensure safe childbirth and that quality care is delivered to women, girls and families. In normal times, this is often not achieved because of acute shortages of health professionals, limited resources and overloaded health facilities. Midwives are continuing to care for women and putting themselves and their own families at the greatest risk, so they both have eagerness to accept SARS-COV-2 vaccine due to all the above rationale behind. This findings also showed that health care workers who had contact with COVID-19 patient were twice as likely to accept the vaccine (AOR:1.93;95%CI:1.360-3.784; P=0.0001) than who hadn't contact with COVID-19 patient were contrary in the study conducted in Ghana[23] which revealed that the HCWs whose relatives have not been diagnosed with COVID-19 were less likely to accept the COVID-19 vaccines if available compared to health care workers whose relatives have been diagnosed with COVID-19. According to our survey health care workers who had contact with COVID-19 patients are more affected by SARS-COV-2 due to direct contact contact with the infected patients. In addition this survey showed that the health care workers who indicated that they had more serious medical condition were 3 times as likely to accept the vaccine (AOR:2.61;95%CI:0.981-3.618;P=0.007) than who hadn't were similar to the study conducted in Egypt[29] which were revealed the presence of comorbidities or chronic diseases were the main factors related

to SARS-COV-2 acceptance. This study also revealed that concerns about the safety of vaccines (AOR:7.041; 95%CI:3.692-13.375;P=0.000) and unwanted side effects of the vaccine (AOR:3.422; 95%CI:1.448-8.096;P=0.005) were the main reasons why health care workers were unwilling to accept the SARS-COV-2 vaccines were consistent with the study employed in Ghana[23] revealed that the safety of vaccines and unwanted side effects of the vaccine were the main reasons why health care workers were unwilling to accept the SARS-COV-2 vaccines. Because while the SARS-COV-2 vaccines are not yet fully approved for commercial use by the Food and Drug Administration (FDA), the FDA has issued Emergency Use Authorization (EUA) of several vaccines due to the public health emergency, based on data from clinical trials that included tens of thousands of participants. Still, the condensed timeline in which the vaccines were developed and received EUA has raised safety and efficacy concerns for some HCWs. Serious side effects that could cause a long-term health problem are extremely unlikely following any vaccination, including COVID-19 vaccination and also myocarditis is the inflammation of the heart muscle, while pericarditis is the inflammation of the lining outside the heart also major side effects decrease SARS-COV-2 vaccines. When we get vaccinated, we often experience some side effects and the reason that we get side effects is that our immune system is revving up and reacting and when we get sick, the same thing happens and actually a lot of the symptoms from illnesses that we get like influenza and COVID, are actually caused not by the direct action of the virus, by our immune system, so our bodies react and that gives us these general symptoms like fever, achiness, headache. Due to the above all rationale they are reluctant to take SARS-COV-2 vaccines.

CONCLUSION AND RECOMMENDATIONS

It is concluded from this study, eagerness to acceptance of covid-19 vaccine among health care workers in Oromia regional state was somewhat low. Nurses and Midwives were more likely to accept the SARS-COV-2 vaccines than others HCWs. Health care workers who had contact with SARS-COV-2 patient were more likely to accept the vaccine than who hadn't contact with SARS-COV-2 patient. Fear of side effects and wearing face mask after vaccination were more likely to hinder acceptance of SARS-COV-2 vaccine. Oromia regional state should have to take promote vaccination of SARS-COV-2 among health care workers by providing to them adequate training. Government and Oromia health bureau must be transparent to health care workers regarding measures in the fight against COVID-19 disease to strengthen trust between them and health care workers to HCWs vaccine acceptance.

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Data availability

The data used in this study can be obtained on written request to the corresponding author.

Supplementary materials

Supplementary File: questionnaire for online survey administered to health care workers. (Supplementary Materials)

REFERENCES

1. Johns Hop kins. Dashboard by the center for systems science and engineering (CSSE).
2. Dhama K, KhanS, TiwariR, SircarS,Bhat S, Malik YS,SinghKP,Chaicumpa W, Bonilla-AldanaDK,Rodriguez-Morales AJ (2020a) Coronavirus Disease 2019- COVID-19. Clin Microbiol Rev. 2020; 33: e00028-20.
3. Centers for Disease Control and Prevention. Coronavirus Disease 2019 (COVID- 19): Cases in the U.S.2020.
4. US National Institute of Allergy and Infectious Diseases. Promising interim results fromclinicaltrialofNIH-ModernaCOVID-19vaccine.
5. Voysey, M.et.al. Safety and efficacy of the ChAdOx1 nCoV-19 vaccine (AZD1222) against SARS-CoV-2:an interim analysis of four randomised controlled trials in Brazil,South-Africa,andtheUK. Lancet. 2021; 397: 99-111.
6. Neumann-Böhme S. Pain and its effects in the human neonate and foetus. N Engl J Med. 1987; 317: 1327-1347.
7. Jegede AS. Homeopathic treatment of newborns and infants-Simillium 2002; 17-40.
8. McAndrew S.& Allington,D. Mode and frequency of COVID-19 information up dates,politicalvalues,and future covid-19 vaccine attitudes. 2020; DOI:10.31234/osf.io/j7srx.
9. Tyson A, Johnson C & Funk C.U.S. public now divided over whether to get COVID -19vaccine. 2020.
10. PadhiBK, Almohaithef MA. Determinants of intent to uptake Coronavirus vaccination among respondents in Saudi Arabia: a web-based national survey. doi: <https://doi.org/10.1101/2020.05.27.20114413>
11. Patel SK, Pathak M, TiwariR, YatooMI, MalikYS, SahR, RabaanAA, Sharun K, DhamaK, Bonilla-AldanaDK, RodriguezMorales AJ. A vaccine is not too far for COVID-19. Journal of Infection in Developing Countries. 2020; 14: 450-453.
12. Enserink M & Cohen, J Fact-checking Judy Mikovits, the controversial virologist attacking Anthony Fauci in a viral conspiracy video. Science. 2020.
13. Kwok K O, Lai F ,Wei W I ,Wong S Y S &Tang J W T. Herd immunity estimating the level required to halt the COVID-19 epidemics in affected countries. J. Infect.2020; 80: 32-33.
14. Altmann D M, Douek D C & Boyton R J. What policy makers need to know about COVID-19 protective immunity. Lancet. 2020; 395: 1527-1529.
15. AdebisiYA, AlaranAJ, BolarinwaOA, Akande-SholabiW, Lucero-Prisno DE. When it is available, will we take it? Public perception of hypothetical COVID-19 vaccine in Nigeria. Pan Afr Med J. 2021; 38: 230.
16. Sim MR. the COVID-19 Pandemic: Major Risks to Healthcare and Other Workers on the Front Line. 2020; 77: 281-282.
17. Lurie N, Saville M, Hatchett R, Halton J. Developing covid-19 vaccines at pandemic speed. N Engl J Med. 2020; 382: 1969-1973.
18. MohamedSA, MohamudAI, Ahmed AA. et.al. Knowledge, Attitude and Practice of People Towards COVID-19 in Benadir Region of Somalia: A Cross-Sectional Study. OSR-JDMS. 2020; 19: 21-26.
19. DubéE. Addressing vaccine hesitancy: the crucial role of healthcare

- providers. *Clin Microbiol Infect.* 2017; 23: 279–280.
20. Mcateer J, Yildirim I, Chahroudi A. The vaccines act: deciphering vaccine hesitancy in the time of COVID-19. *Clin Infect Dis.* 2020; 28: 703-705.
21. Kabamba Nzaji et al. Acceptability of Vaccination Against COVID-19 Among Healthcare Workers in the Democratic Republic of the Congo. *Pragmatic and Observational Research* 2020;11: 103–109.
22. Idiris A, Mohamud, Abdullahi SH, Mohamed and Abdullahi K Jimale. Assessments of a COVID-19 vaccine acceptance rate in population of Benadir region, Somalia. *IOSR Journal of Dental and Medical Sciences.* 2021; 20: 1-4.
23. <https://www.hindawi.com/journals/aph/2021/9998176/Wiredu%20M,%20Agyekum,%20Frempong%20G,%20Afrifa-Anane,Kyei-F%20Arthur%20and%20AddoB.%20Acceptability%20of%20COVID-19%20Vaccination%20among%20Health%20Care%20Workers%20in%20Ghana.%20Advances%20in%20Public%20Health.%202021;%20https://doi.org/10.1155/2021/9998176>.
24. Detoc M, Bruel S, Frappe P, Botelho-Nevers E, Gagneux-Brunon A. Intention to participate in a COVID-19 vaccine clinical trial and to get vaccinated against COVID-19 in France during the pandemic. *Vaccine.* 2020; 38: 7001-7006.
25. [https://www.medrxiv.org/content/10.1101/2020.04.09.20060103v1Fu%20C,%20WeiZ,%20PeiS,%20etal.%20Acceptance%20and%20preference%20for%20COVID-19%20vaccination%20in%20health-care%20workers%20\(HCWs\).%20medRxiv.%202020.%20https://www.medrxiv.org/content/10.1101/2020.04.09.20060103v1](https://www.medrxiv.org/content/10.1101/2020.04.09.20060103v1Fu%20C,%20WeiZ,%20PeiS,%20etal.%20Acceptance%20and%20preference%20for%20COVID-19%20vaccination%20in%20health-care%20workers%20(HCWs).%20medRxiv.%202020.%20https://www.medrxiv.org/content/10.1101/2020.04.09.20060103v1).
26. Thunstrom L, Ashworth M, Finnoff D, et al. Hesitancy Towards a COVID-19 Vaccine and Prospects for Herd Immunity. 2020.
27. Kucukoglu S, Kurt S, Aytakin A. The effect of the facilitated tucking position in reducing vaccination-induced pain in newborns. *Ital J Pediatr.* 2015; 24: 41:61.
28. Al-Mohaithef M, Padhi BK et al. Determinants of COVID-19 Vaccine Acceptance in Saudi Arabia: A Web-Based National Survey. *J Multidiscip Healthc.* 2020; 13: 1657-1663.
29. <https://www.medrxiv.org/content/10.1101/2021.01.11.21249324v1Aliae%20AR%20Mohamed%20Hussein%20et%20al.%20A%20national%20survey%20of%20potential%20acceptance%20of%20COVID-19%20vaccines%20in%20healthcare%20workers%20in%20Egypt.%20doi:%20https://doi.org/10.1101/2021.01.11.21249324>.
30. K. Wang, E L Y Wong, K F Ho et al., "Intention of nurses to accept coronavirus disease 2019 vaccination and change of intention to accept seasonal influenza vaccination during the coronavirus disease 2019 pandemic: a cross-sectional survey. *Vaccine.* 2020; 38: 7049-7056.
31. Mark Shen, Gladys El Chaar. Reducing pain from heel lances in neonates following education on oral sucrose. *Int J Clin Pharm.* 2015; 37:529-536.
32. Ekaete Alice Tobin, Martha Okonofua I, Azuka Azeke, Vivian Ajekweneh, George Akpede. Willingness to acceptance a covid-19 vaccine in Nigeria: a population-based cross-sectional study. *J Med Res.* 2021; 7: 53-60.

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